

Hard maple

Sugar maple: *Acer saccharum*

Black maple: *Acer nigrum*



Hard maples are slow-growing, shade-tolerant species. Sugar maple is the most important species making up the maple-basswood forest type of northern Wisconsin. The **volume of hard maple has increased** by almost 60% since 1983 but hasn't changed since 1996.

Growth rates have remained unchanged and **mortality has decreased**. Hard maple accounts for about 11% of all volume and growth of trees in Wisconsin, but only 2.1% of total mortality.

Hard maple is **an important timber species**, accounting for 16% of roundwood production. Because of the high density of its wood and the large volume in the state, hard maple may be a valuable species for woody biomass production.

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"How has the hard maple resource changed?"
Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of hard maple in 2012 was about 2.4 billion cft or 11% of total volume in the state (Chart 1). This is an increase of 58% since 1983. Volume has increased slightly since 1996.

Hard maple growing stock has matured since 1983 with a greater increase in the volume of large sawtimber compared to smaller trees (Chart 2).

The numbers of [sawtimber](#) trees have increased since 1996 but the numbers of [seedlings](#) and [poles](#) have decreased (Chart 3).

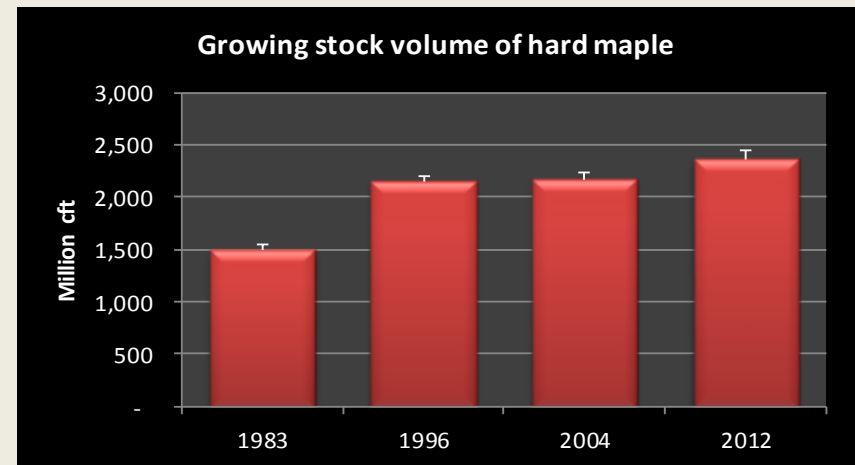


Chart 1. Growing stock volume (million cubic feet) by inventory year.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

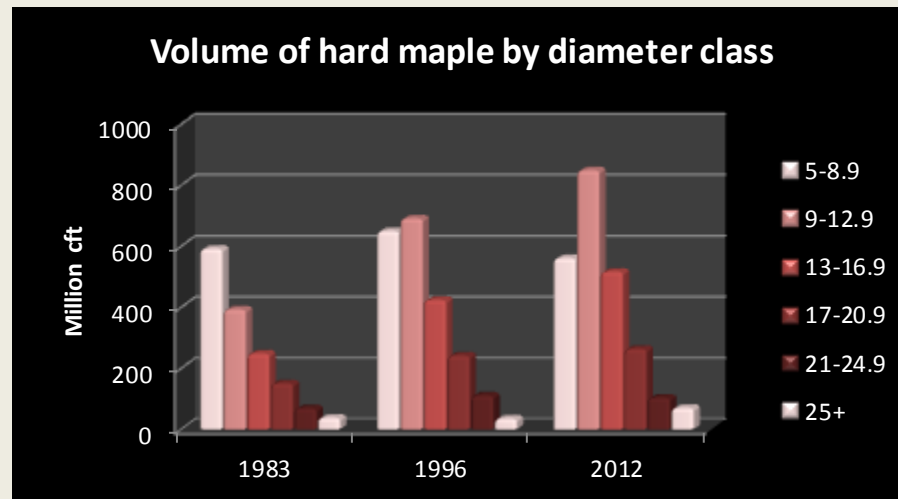


Chart 2. Growing stock volume (million cubic feet) in 1983, 1996, and 2012.
 Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2012.

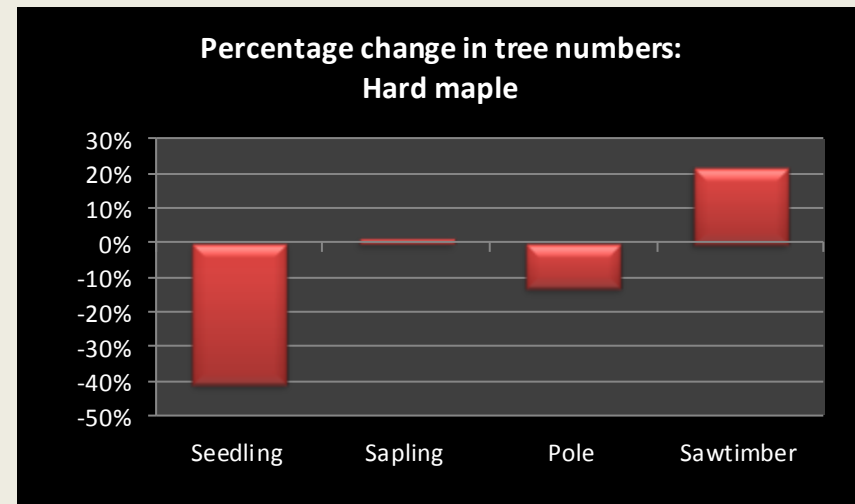
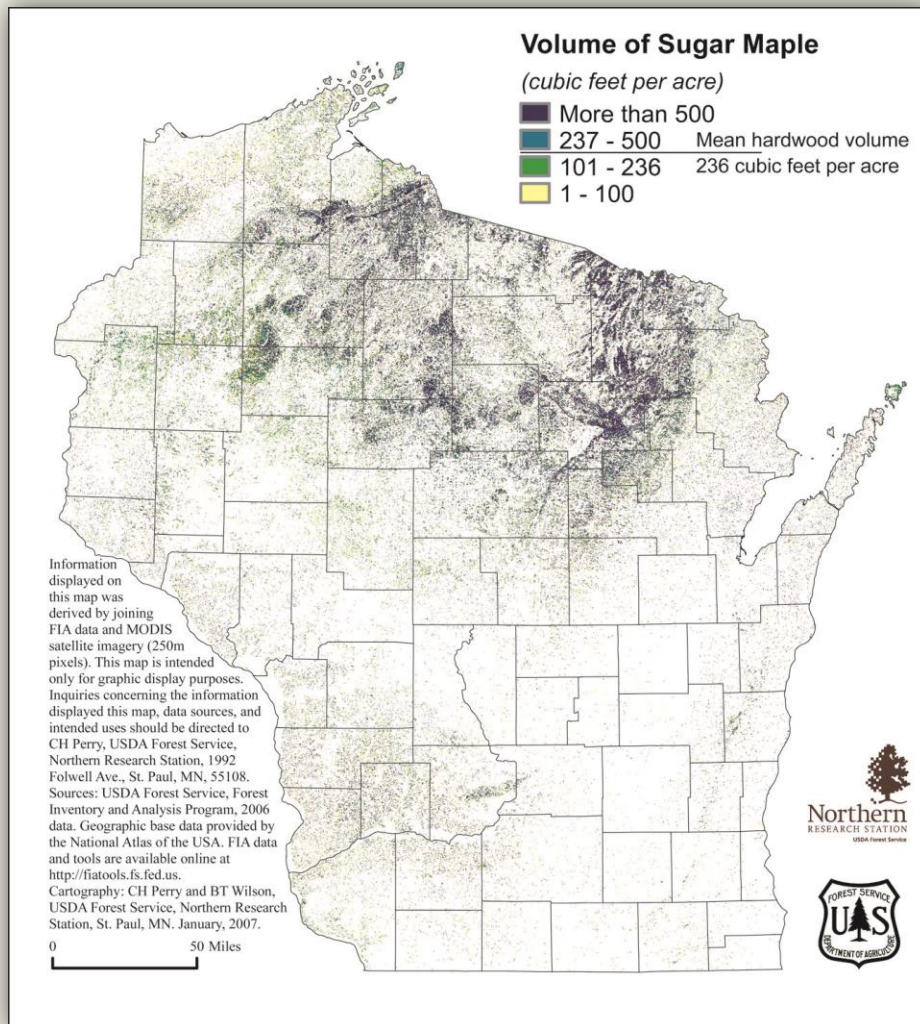


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2012.
 Source: USDA Forest Inventory and Analysis data 1996, and 2012.

"Where does hard maple grow in Wisconsin?"

Growing stock volume by region with map



About 81% of hard maple volume is located in northern Wisconsin with another 13% in the south (Table 1). It is a major component of the maple-basswood [forest type](#) and a minor component of oak-hickory and aspen-birch types.

Table 1. Growing stock volume (million cft) by species and region of the state.

Species	Central	North east	North west	South east	South west	Total
Sugar Maple	159	1,055	849	121	183	2,367
Percent of total	7%	45%	36%	5%	8%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2012 data

For a table on **Volume by County for 2012** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/VolumeCountySpecies.pdf>



"How fast is hard maple growing?"

Average annual net growth by region and year

The [average annual net growth rate](#) of hard maple was about 61.2 million cft/year between 2008 and 2012, or 10.7% of total volume growth in the state (Chart 4). The rate of growth has increased 30% since 1983 but remained statistically unchanged since 1996.

Table 2. Average annual net growth (million cft/year) of growing stock and the ratio of growth to volume by region of the state.

Region	Net growth	Percent of Total	Ratio of growth to volume
Central	4.8	8%	3.0%
Northeast	25.8	42%	2.4%
Northwest	20.3	33%	2.4%
Southeast	3.6	6%	3.0%
Southwest	6.7	11%	3.7%
Statewide	61.2	100%	2.6%

Source: USDA Forest Inventory and Analysis 2012

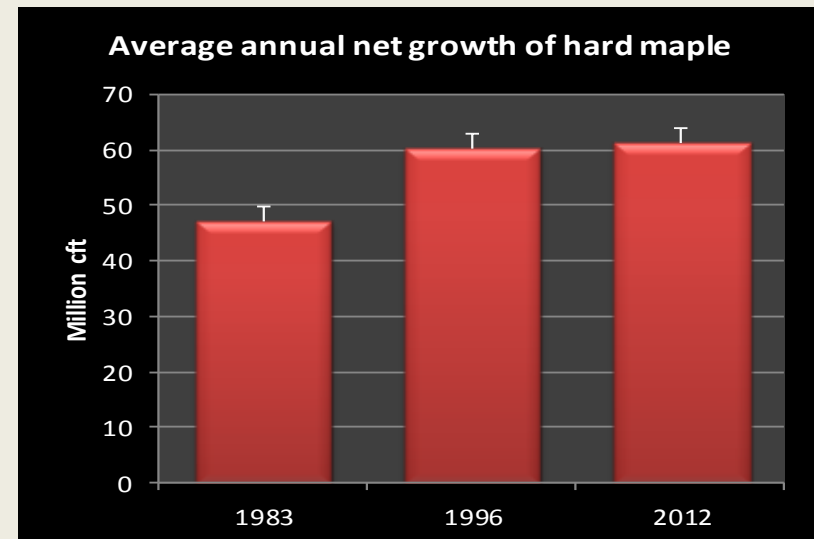


Chart 4. Average annual net growth (million cubic feet).

Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2012

Although northern Wisconsin has the highest percentage of volume growth in hard maple, the ratio of growth to volume is highest in the southwest region (Table 2). The average statewide ratio for hard maple is 2.6%, about the same as the percentage for all species in the state, 2.6%. Sugar maple is a shade tolerant, slow-growing species.

For a table of **Average annual growth, mortality and removals by region** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How healthy is hard maple in Wisconsin?"

Average annual mortality: 1983, 1996, and 2012

Average annual mortality of hard maple, about 4.9 million cft per year between 2008 and 2012, has decreased 16% since 1996 (Chart 5).

The ratio of mortality to gross growth is only 7.5% for hard maple (Table 3). This is **much lower than the statewide average** of 29.3% and lower than any other species except red and white pine. Whereas sugar maple accounts for 11% of total growing stock volume in the state, it makes up only 2.1% of total mortality.

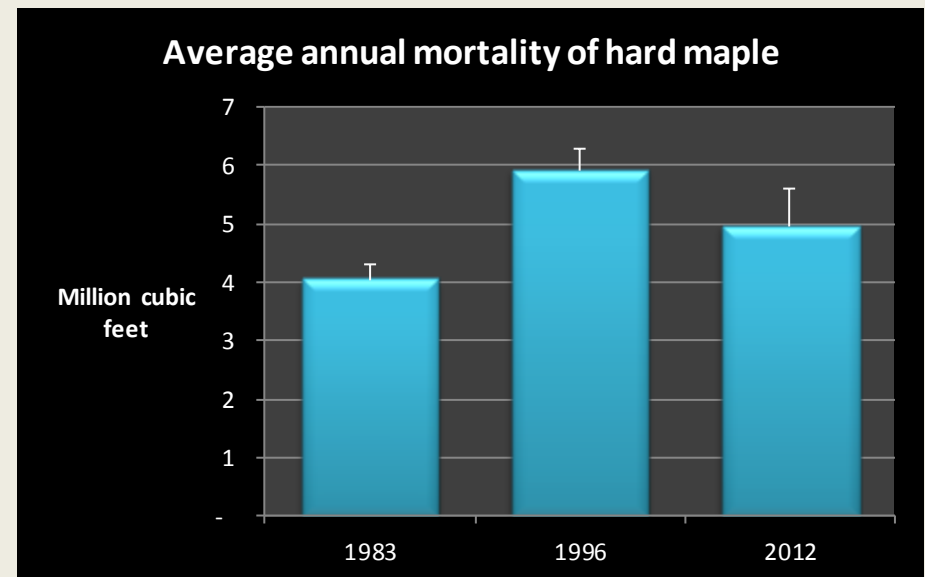


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2012

Table 3. Mortality, gross growth, and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Sugar Maple	4,945,191	66,161,437	7.5%

Source: USDA Forest Inventory & Analysis data: 2012

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much hard maple do we harvest?"

Roundwood production by product and year

Sugar maple is an important timber species in Wisconsin. In 2009, the state produced about 56.5 million cft of hard maple or 16% of total [roundwood product](#) (Chart 6). At that time, 60% was used for pulpwood and 26% for sawlogs and veneer. Sugar maple accounts for 20% of statewide production for these two products.

Sugar maple roundwood production has remained unchanged since 2003 although pulpwood has dropped slightly.

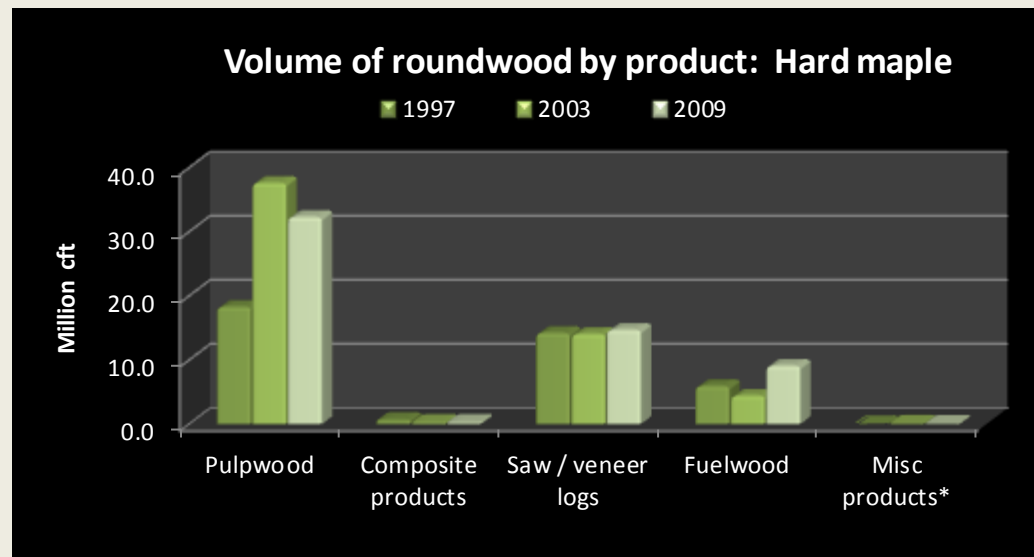


Chart 6. Volume of roundwood products. * Miscellaneous products include poles, posts, and pilings.
Source: Ronald Piva, USDA Forest Service, Northern Research Station, St. Paul MN

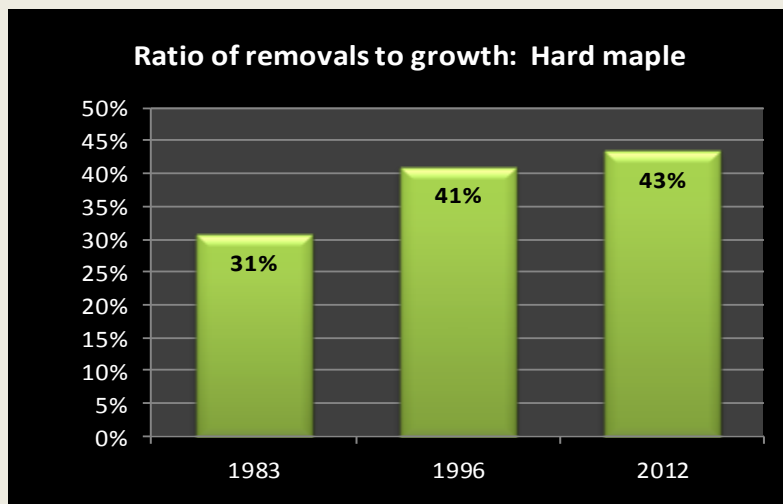


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012.

The ratio of removals to growth for hard maple is 43%, lower than the statewide average of 53% for all species.

For a table of **Average annual growth, mortality and removals by region** go to:
<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/GrowthMortalityRemovals.pdf>



"How much is hard maple selling for?"

Prices for cordwood and sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and the [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR46.

Sawtimber prices, as reported in the Timber Mart North (Chart 8), have decreased since 2000.

Hard maple cordwood and sawlog prices, as reported in NR46 (Table 4), peaked in 2006 and have decreased since then. Sawlog prices, however, are substantially higher than the statewide average for all hardwood species.

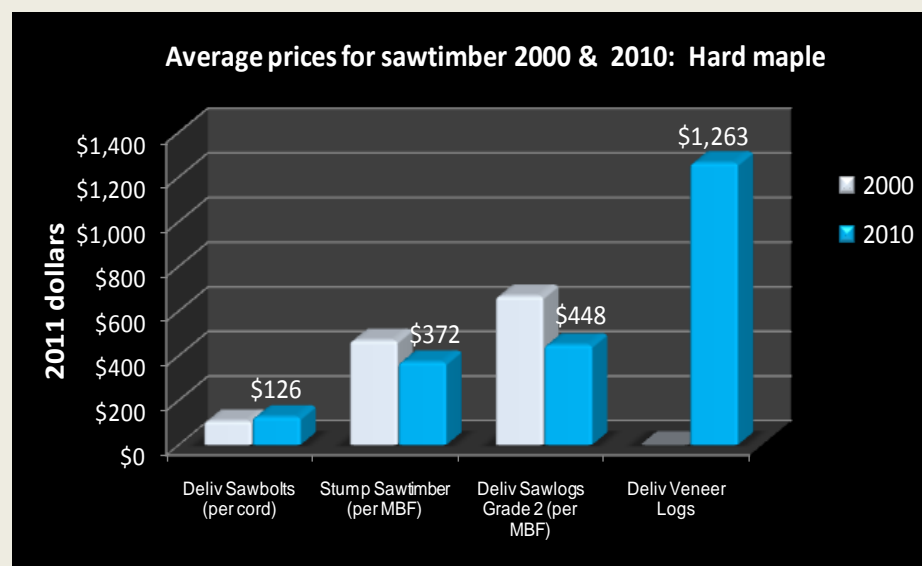


Chart 8. Average prices for cordwood and sawtimber (2012).
Source: Wisconsin Administrative Code Chapter NR46, 2000 to 2012

Table 4. Average weighted stumpage prices (adjusted for inflation to 2012 dollars) by year for Wisconsin.

Product	2002	2003	2004	2005	2006	2008	2008	2009	2010	2012	Average for all hardwoods
Cordwood (per cord)	\$35	\$16	\$21	\$38	\$37	\$51	\$54	NA	\$24	\$23	\$19
Logs (per MBF)	\$433	\$415	\$427	\$465	\$542	\$682	\$552	\$355	\$345	\$255	\$148

Source: Wisconsin Administrative Code Chapter NR46, 2002 to 2012. The stumpage values calculated each year are for the sole purpose of assessing MFL yield and FCL severance taxes, not for determining the price that should be received for timber.



"How much hard maple biomass do we have?"

Aboveground carbon by region of the state

There were 82.6 million short tons of aboveground biomass in live hard maple trees in 2012, a 39.5% increase since 1983. This is equivalent to approximately 41 million tons of carbon and represents 13.2% of all biomass statewide. As with volume, most hard maple is located in northern Wisconsin (Chart 9).

Hard maple has a much higher density than other commercial hardwood species in Wisconsin, with a ratio of biomass to volume of 57.8 oven-dry lbs. per cubic foot (ODP/cft). The average for all hardwoods is about 50.1 ODP/cft and for all species is 46.8 ODP/cft. Approximately, 75% of all hard maple biomass is located in the main stem and 21% in branches.

The amount of hard maple as well as the high density of its wood may make it a valuable species for biomass production.

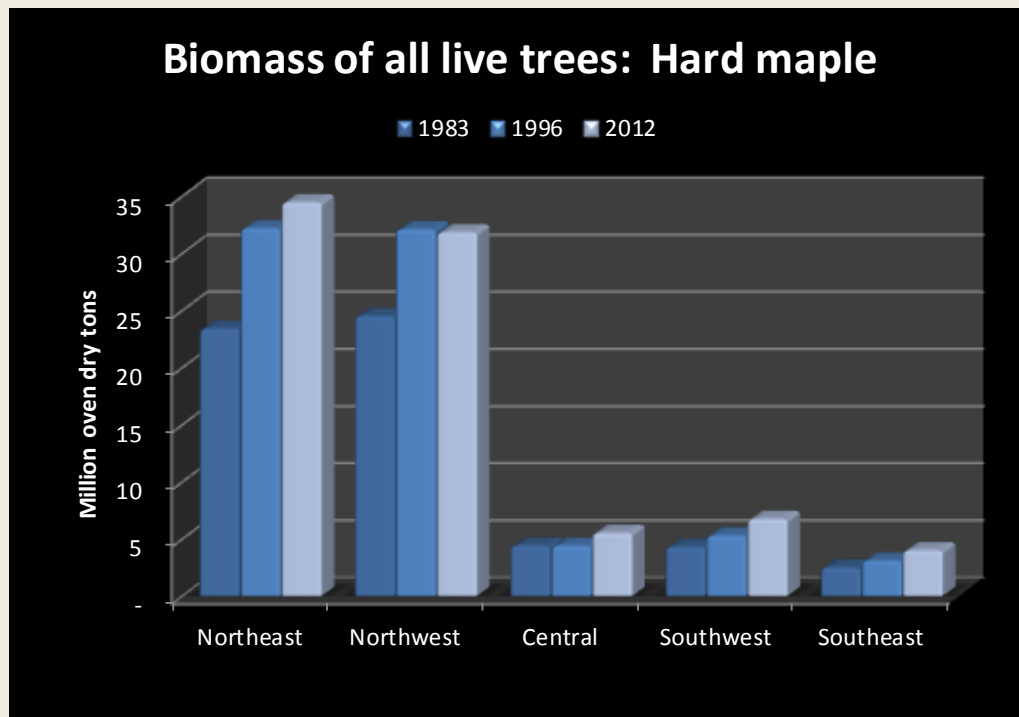


Chart 9. Biomass (million oven-dry tons) by year and region.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2012

For a table of **Biomass by County for 2012** go to:

<http://dnr.wi.gov/topic/ForestBusinesses/documents/tables/BiomassByCounty.pdf>